REMARKS

Claims 1, 10, 11, 24-26, 37-39, 50-52, 54, 55 and 62 have been amended. Reconsideration and allowance based on the following remarks are respectfully requested.

REJECTIONS UNDER 35 U.S.C. §112

Claims 10, 11, 37 and 38 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant respectfully traverses. Merely to expedite prosecution, claims 10, 11, 37, and 38 have been amended for clarification purposes. As such, Applicant respectfully requests that the rejection of claims 10, 11, 37 and 38 under 35 U.S.C. § 112, second paragraph be withdrawn.

REJECTIONS UNDER 35 U.S.C. §102

Claims 26-34, 36, 39, 41, 43, 44, 47, 48, and 52-55 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,545,746 to Nishi (hereinafter "Nishi '746"). Applicant respectfully traverses this rejection.

Applicant submits that the cited portions of Nishi '746 fail to disclose or teach a lithographic projection apparatus comprising, *inter alia*, a radiation-energy detector configured to determine the energy of the beam of radiation, the beam of radiation passing at least partly through a region of interactive gas, the detector comprising a sensor, the sensor, in operation, providing an output signal that is proportional to an amount of interaction of the beam of radiation with the region of gas and measuring the amount of interaction of the beam of radiation with the region of gas out of a path of the beam of radiation, as recited in claim 26.

As noted in the Applicant's previous responses, the cited portions of Nishi '746 make no mention or suggestion of a radiation-energy detector as recited in claim 26. The Office Action states on page 11 that Nishi '746 discloses a "light quantity control method" and that "illuminating light IL [is] to be continuously controlled in a predetermined range," and, therefore, in order to control the lighting, a detector is required. Applicant respectfully disagrees. While the cited portions of Nishi '746 may discuss *reducing or increasing* the amount of illuminating light IL, this does not necessarily imply that Nishi '746 provides a radiation-energy detector as claimed (and indeed, Applicant submits that nowhere do the cited portions of Nishi '746 disclose or suggest this). In fact, a detector or sensor is not

needed or disclosed in the cited portions of Nishi '746 to control an amount of light. Consider, for example, a water tap. To control the amount of water flowing through a tap, no detector of the water is required, rather only the valve needs to be opened or closed. Similarly, the cited portions of Nishi '746 merely disclose varying the pressure of gas to control its absorptance/transmittance which in turn controls the amount of illuminating light. No detector is needed or disclosed in the cited portions of Nishi '746.

Furthermore, even if one could assume that the cited portions of Nishi '746 provide or suggest the use of a detector or sensor, which Applicant certainly does not concede, the cited portions of Nishi '746 would fail to disclose or teach a radiation-energy detector as recited in claim 26, or a sensor, in operation, providing an output signal that is proportional to an amount of interaction of the beam of radiation with the region of gas as recited in claim 26. The cited portions of Nishi '746 merely disclose that the amount of illuminating light IL is controlled by varying the pressure of the gas in the container 141. More specifically, a bellows mechanism 142 is extended and contracted to enable the pressure (i.e., the absorptance with respect to the illuminating light IL), to be continuously controlled. (*See, e.g.*, column 35, line 55-column 36, line 24). Thus, it is respectfully submitted that, rather than measuring an amount of interaction of the radiation with the gas, Nishi '746 would more likely measure a pressure of the gas so that the pressure can be adjusted to raise the absorptance of a gas. Considering the water tap example presented above again. To control the amount of water flowing through a tap, no detector is required to detect the flow rate or the energy of the flow. Rather a detector may be used to determine how much the valve is opened or closed knowing that how much the tap is open or closed will control the flow rate. Similarly, the cited portions of Nishi '746 would at most merely disclose measuring the pressure of the gas to control its absorptance/transmittance. No radiation-energy detector is needed or disclosed in the cited portions of Nishi '746.

Therefore, Applicant respectfully submits that a case of anticipation has not been established and that the cited portions of Nishi '746 fail to disclose, teach, or suggest each and every element recited by claim 26. Claims 52, 54, and 55 are patentable over the cited portions of Nishi '746 for at least similar reasons as provided above for claim 26, and for the features recited therein. Claims 27-34, 36, 39, 41, 43, 44, 47, 48, and 53 respectfully depend from claims 26 and 52 and are, therefore, patentable for at least the same reasons provided above related to claims 26 and 52, and for the additional features recited therein. Thus, Applicant respectfully requests that the rejection of claims 26-34, 36, 39, 41, 43, 44, 47, 48,

and 52-55 under 35 U.S.C. §102(e) over Nishi '746 should be withdrawn and the claims be allowed.

Claims 26, 27, 30, 52, 54 and 55 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Application Publication No. 2001/0030740 to Mori et al. (hereinafter "Mori"). The rejection is respectfully traversed.

Applicant submits that the cited portions of Mori fail to disclose a lithographic projection apparatus comprising, *inter alia*, a radiation-energy detector configured to determine the energy of the beam of radiation, the beam of radiation passing at least partly through a region of interactive gas, the detector comprising a sensor, the sensor, in operation, providing an output signal that is proportional to an amount of interaction of the beam of radiation with the region of gas and measuring the amount of interaction of the beam of radiation with the region of gas out of a path of the beam of radiation, as recited in claim 26.

For example, the light detector 24 of Mori, alleged by the Office Action to be the claimed sensor, merely measures the intensity of light, passing through the projection lens, in a path of the light beam. (*See, e.g.,* Figure 1 and paragraph [0058] of Mori). Therefore, the cited portions of Mori do not disclose, for example, a sensor, in operation, providing an output signal that is proportional to an amount of interaction of the beam of radiation with the region of gas and measuring the amount of interaction of the beam of radiation with the region of gas out of a path of the beam of radiation, as recited in claim 26. Rather, for example, the cited portions of Mori disclose and teach the opposite since, in order for the light detector 24 of Mori to detect the intensity of light passing through the projection lens, the light detector 24 of Mori must be in the path of the beam of light.

Therefore, Applicant respectfully submits that a case of anticipation has not been established and that the cited portions of Mori fail to disclose each and every element recited by claim 26. Claims 52, 54, and 55 are patentable over the cited portions of Mori for at least similar reasons as provided above for claim 26, and for the features recited therein. Claims 27 and 30 respectfully depend from claim 26 and are, therefore, patentable for at least the same reasons provided above related to claim 26, and for the additional features recited therein. Thus, Applicant respectfully requests that the rejection of claims 26, 27, 30, 52, 54 and 55 under 35 U.S.C. §102(e) over Mori should be withdrawn and the claims be allowed.

Claims 26-34, 36, 39, 41, 43, 44, 47, 48, and 52-55 were rejected under 35 U.S.C. §102(b) as being anticipated by Japanese Patent Application Publication No. JP 11-354409 to Shiozawa (hereinafter "Shiozawa"). The rejection is respectfully traversed.

Applicant notes that the Office Action asserts specific portions of the Japanese text of Shiozawa. Per MPEP §706.02(II), a translation of Shiozawa must be supplied to Applicant so that the record is clear precisely which facts from Shiozawa are being relied on. In the event the rejection based on Shiozawa is maintained, it is respectfully submitted that a translation must be provided to Applicant and a new non-final Office Action be issued. In the absence of such a translation, it is respectfully submitted that the rejection based on Shiozawa must be withdrawn.

For the sake of expediting prosecution, based on Applicant's best understanding of the abstract and figures of Shiozawa, Applicant respectfully submits that the cited portions of Shiozawa fail to disclose or teach a lithographic projection apparatus comprising, *inter alia*, a radiation-energy detector configured to determine the energy of the beam of radiation, the beam of radiation passing at least partly through a region of interactive gas, the detector comprising a sensor, the sensor, in operation, providing an output signal that is proportional to an amount of interaction of the beam of radiation with the region of gas and measuring the amount of interaction of the beam of radiation with the region of gas out of a path of the beam of radiation as recited in claim 26.

The cited portions of Shiozawa disclose an illuminator in which the oxygen concentration or wavelength of a source is changed to obtain a uniform illuminance distribution on a wafer. (*See* Abstract of Shiozawa). The Office Action refers to element 16 in Shiozawa, which appears to be a sensor. However, Applicant respectfully submits that Shiozawa does not disclose or teach a sensor, in operation, providing an output signal that is proportional to an amount of interaction of the beam of radiation with the region of gas and measuring the amount of interaction of the beam of radiation with the region of gas out of a path of the beam of radiation as recited in claim 26. Rather, for example, Shiozawa appears to disclose and teaches the opposite since, in order for element 16 of Shiozawa to measure the light, the sensor 16 of Shiozawa must be in the path of the beam of light.

Claims 52, 54, and 55 are patentable over the cited portions of Shiozawa for at least similar reasons as provided above for claim 26, and for the features recited therein.

Claims 27-34, 36, 39, 41, 43, 44, 47 and 48 depend from claim 26 and are, therefore, patentable for at least the same reasons provided above related to claim 26, and for the additional features recited therein. Claim 53 depends from claim 52, and is therefore patentable for at least the same reasons as noted above related to claim 52, and for the additional features recited in therein. Thus, Applicant respectfully requests that the rejection

of claims 26-34, 36, 39, 41, 43, 44, 47, 48, and 52-55 under 35 U.S.C. §102(b) over Shiozawa should be withdrawn and the claims be allowed.

REJECTIONS UNDER 35 U.S.C. §103

Claim 35 was rejected under 35 U.S.C. §103(a) as being unpatentable over Nishi '746 in view of U.S. Patent Application Publication No. 2003/0020888 to Tanaka et al. (hereinafter "Tanaka"). Applicant respectfully traverses this rejection.

Claim 35 depends from claim 26. As discussed above, the cited portions of Nishi '746 fail to disclose or render obvious each and every element of claim 26.

Even assuming *arguendo* that Nishi '746 and Tanaka are properly combinable (which Applicant does not concede), Applicant submits the cited portions of Tanaka fail to overcome the shortcomings of Nishi '746. For example, the cited portions of Tanaka merely disclose providing pressure sensors for sensing pressure within the spaces between the optical elements and adjusting the optical performance of the optical system based on the pressures detected by the pressure sensor. (*See, e.g.,* paragraph [0020] of Tanaka). The cited portions of Tanaka make no mention or suggestion of a sensor, in operation, providing an output signal that is proportional to an amount of interaction of the beam of radiation with the region of gas and measuring the amount of interaction of the beam of radiation with the region of gas out of a path of the beam of radiation, as recited in claim 26.

Therefore, Applicant respectfully submits that a *prima facie* case of obviousness has not been established and that the cited portions of Nishi '746, Tanaka, or a proper combination thereof, fail to disclose or render obvious each and every element recited by claim 26. Claim 35 depends from claim 26 and is, therefore, patentable for at least the same reasons provided above related to claim 26, and for the additional features recited therein. Thus, Applicant respectfully requests that the rejection of claim 35 under 35 U.S.C. §103(a) over Nishi '746 in view of Tanaka should be withdrawn and the claims be allowed.

Claims 45 and 46 were rejected under 35 U.S.C. §103(a) as being unpatentable over Nishi '746 in view of U.S. Patent No. 6,353,219 to Kley (hereinafter "Kley").

Claims 45 and 46 depend from claim 26. As discussed above, the cited portions of Nishi '746 fail to disclose or render obvious each and every claim element of claim 26.

Even assuming *arguendo* that Nishi '746 and Kley are properly combinable (which Applicant does not concede), Applicant submits the cited portions of Kley fail to overcome the shortcomings of Nishi '746. The cited portions of Kley simply fail to disclose or render obvious a sensor, in operation, providing an output signal that is proportional to an amount of

interaction of the beam of radiation with the region of gas and measuring the amount of interaction of the beam of radiation with the region of gas out of a path of the beam of radiation, as recited in claim 26.

Therefore, Applicant respectfully submits that a prima facie case of obviousness has not been established and that the cited portions of Nishi '746, Kley, and combination thereof fail to disclose, teach, or suggest each and every element recited by claim 26. Claims 45 and 46 depend from claim 26 and are, therefore, patentable for at least the same reasons provided above related to claim 26, and for the additional features recited therein. Thus, Applicant respectfully requests that the rejection of claims 45 and 46 under 35 U.S.C. §103(a) over Nishi '746 in view of Kley should be withdrawn and the claims be allowed.

Claims 1-7, 9, 13-17, 20-22, 24, 25, 50, 51 and 62 were rejected under 35 U.S.C. §103(a) as being unpatentable over Shiozawa in view of U.S. Patent No. 6,414,743 to Nishi et al. (hereinafter "Nishi '743"). The rejection is respectfully traversed.

Applicant notes that the Office Action asserts specific portions of the Japanese text of Shiozawa. Per MPEP §706.02(II), a translation of Shiozawa must be supplied to Applicant so that the record is clear precisely which facts from Shiozawa are being relied on. In the event the rejection based on Shiozawa is maintained, it is respectfully submitted that a translation must be provided to Applicant and a new non-final Office Action be issued. In the absence of such a translation, it is respectfully submitted that the rejection based on Shiozawa must be withdrawn.

For the sake of expediting prosecution, based on Applicant's best understanding of the abstract and figures of Shiozawa, Applicant respectfully submits that the cited portions of Shiozawa, Nishi '743, and a proper combination thereof, fail to disclose or render obvious a lithographic projection apparatus comprising, *inter alia*, a radiation absorber comprising a gas supply configured to supply an absorbent gas at a controlled concentration to at least one enclosure traversed by the beam of radiation, the absorbent gas serving to absorb radiation energy delivered by the beam of radiation to the substrate during exposure of the radiation-sensitive material to the patterned beam of radiation, wherein the absorbent gas comprises one of water (H2O); a hydrocarbon; or a mixture thereof, as recited in claim 1.

The cited portions of Shiozawa fail to disclose or teach a radiation absorber as recited in claim 1. Specifically, the cited portions of Shiozawa disclose an illuminator in which the oxygen concentration or wavelength of a source is changed to obtain a uniform illuminance distribution on a wafer. (*See* Abstract of Shiozawa). The cited portions of Shiozawa do not

appear to disclose or teach that the supplied absorbent gas comprises water, a hydrocarbon, or a mixture thereof as recited in claim 1.

Applicant submits the cited portions of Nishi '743 fail to overcome the shortcomings of Shiozawa. The cited portions of Nishi '743 simply fail to disclose or teach a radiation absorber comprising a gas supply configured to supply an absorbent gas, wherein the absorbent gas comprises one of water; a hydrocarbon; or a mixture thereof as recited in claim 1. Rather, the cited portions of Nishi '743 disclose filling the space of the projection system PL with an inert gas such as nitrogen or helium gas, with a reduced oxygen content. (*See, e.g.,* column 19, lines 37-43 of Nishi '743). Additionally, the cited portions of Nishi '743 describe removing molecules of impurities that are present in the light path by using a chemical filter or an electrostatic filter. Specifically, the cited portions of Nishi '743 note that the inert gas is forced to flow in the light path when a variation in transmittance is taken into consideration, and, that the variation in transmittance may caused by attachment on the optical elements of water molecules, hydrocarbon molecules or the like. (*See, e.g.,* column 19, lines 50-61). Thus, the cited portions of Nishi '743 merely note that water molecules and hydrocarbon molecules may be attached to the optical elements and that these molecules may cause variation in transmittance of light. The cited portions of Nishi '743 disclose using a filter to remove such molecules. Thus, Nishi '743 teaches away from claim 1. Specifically, the cited portions of Nishi '743 do not disclose supply of an absorbent gas, the gas comprising water, a hydrocarbon, or a mixture thereof. Rather, the cited portions of Nishi '743 disclose or teach that water and a hydrocarbon should be removed or avoided and certainly countenance against supply of water and/or hydrocarbon.

Moreover, merely because the cited portions of Nishi '743 disclose that water or a hydrocarbon may cause variation in transmittance does not mean that would water or hydrocarbon would be an "appropriate substitute" for oxygen in the Shiozawa illuminator. As the cited portions of Nishi '743 note, water and hydrocarbon can become attached to an optical element and thus cause an undesired and uncontrolled variation in transmittance. There is no indication that the nitrogen, helium or oxygen gas would or could cause the same effect. Thus, there is no indication in the cited portions of Nishi '743 and Shiozawa of the "appropriate substitute" of water and/or hydrocarbon for oxygen. Rather, the cited portions of Nishi '743 teach the opposite – that water and/or hydrocarbon is undesirable.

Therefore, Applicant respectfully submits that a prima facie case of obviousness has not been established and that the cited portions of Shiozawa, Nishi '743, and a proper combination thereof fail to disclose or render obvious each and every element recited by

claim 1. Claims 2-7, 9, 13-17, and 20-22 depend from claim 1, and, therefore, are patentable over Shiozawa, Nishi '743, and a proper combination thereof for at least the same reasons as provided above with respect to claim 1, and for the features recited therein. Claims 24, 25, 50, 51, and 62 are patentable over the cited portions of Shiozawa, Nishi '743, and a proper combination thereof, for at least similar reasons as provided above for claim 26, and for the features recited therein. Thus, Applicant respectfully requests that the rejection of claims 1-7, 9, 13-17, 20-22, 24, 25, 50, 51 and 62 under 35 U.S.C. §103(a) Shiozawa in view of Nishi '743 should be withdrawn and the claims be allowed.

DOUBLE-PATENTING REJECTION

Claims 1-7, 9, 13, 15-19, 21-26, 29, 31-34, 36, 39, 40-43, 47-55, and 62 were rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2, and 5-23 of U.S. Patent No. 6,538,716. Claims 8, 14, 30 and 35 were rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 5, 7, and 19 of U.S. Patent No. 6,538,716 in view of Tanaka. Applicant traverses these rejections for at least similar reasons as provided in the Applicant's previous responses, which are incorporated herein in their entirety by reference.

Nevertheless, Applicant would consider filing a terminal disclaimer when the obviousness-type double patenting rejections are the only rejections remaining in the application. Thus, if the present claims are otherwise allowable, but for the obviousness-type double patenting rejections, the Examiner is kindly requested to contact the undersigned regarding filing a terminal disclaimer at that time.

All rejections have been addressed. It is respectfully submitted that the present application is in condition for allowance, and a notice to that effect is earnestly solicited. Should there be any questions or concerns regarding this application, the Examiner is invited to contact the undersigned at the below-listed telephone number.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,

PILLSBURY WINTHROP SHAW PITTMAN LLP

JEAN-PAUL G. HOFFMAN
Reg. No. 42663
Tel. No. 703.770.7794
Fax No. 703.770.7901

JGH/JAS
P.O. Box 10500
McLean, VA 22102
(703) 770-7900